I. THE CLAIMED INVENTION

Applicant's invention, as disclosed and claimed, is directed to a transparent laminate having n thin-film units laminated unit by unit successively on a surface of a substrate, and a high-refractive-index transparent thin film deposited on a surface of the laminate of the n thin-film units. Each of the n thin-film units includes a high-refractive-index thin film and a silver transparent conductive film. When the silver transparent conductive thin films are deposited by a vacuum dry process, <u>the temperature T(K) of the transparent substrate at the time of film deposition is in the range of 340 to 410 K</u>, whereby the transparent laminate has a standard deviation of visible light transmittance which is not larger than 5% in a wave range of from 450 to 650 nm.

This configuration has a reduced wavelength dependence of visible light transmittance so that the laminate can exhibit the color tone of neutral gray without the addition of any absorbent such as a dye. The laminate also has transmittance which is high enough over the entire visible light range and can satisfy all the properties such as electromagnetic wave shielding, near-infrared cuttin, visible light low-reflectance, etc. as required of a PDP film in spite of the simple structure. Moreover, the invention provides a light-weight thin PDP filter of good visibility.

II. THE APPLIED REFERENCES

The Office action rejects claim 13 under 35 U.S.C. 103(a) over Anzaki et al.; claim 14 under 35 U.S.C. 103(a) over Anzaki et al. in view of Noreika et al. and either Nulman or Shiroishi et al.; claim 13 under 35 U.S.C. 103(a) over Okamura et al. in view of Kenzo et al.; and claim 14 under 35 U.S.C. 103(a) over Okamura et al. in view of Kenzo et al. in further view of Noreika et al. and either Nulman or Shiroishi. Applicants respectfully traverse these rejections.

None of the applied references teaches or suggests the features of independent claims 13 and 14 including: 1) depositing a silver transparent conductive thin film when a temperature of the transparent substrate <u>at the time of deposition is within a range of 340 to</u>

410 k (claim 13); 2) depositing a silver transparent conductive thin film when a temperature of the transparent substrate at the time of deposition is within a range of 340 to 390 k (claim 14); and 3) a deposition rate of the silver transparent conductive thin film of R = (1/40)x(T-300)±0.5 (claim 14). Rather, as pointed out by Examiner Markham, Anzaki et al. teaches heating the substrate to a temperature of 573k or lower during the silver film formation and Kenzo et al. teaches performing a sputtering process at a substrate temperature between room temperature (about 296k) to 180 C (453 K). While the ranges disclosed in the applied references overlap the ranges set forth in claims 13 and 14, none of the applied references teach or suggest the criticality of the claimed temperature ranges. Applicants can rebut a prima facie case of obviousness based on overlapping ranges by showing the criticality of the claimed range (M.P.E.P. 2144.05(III)).

The specification of the present application explains the problems associated with having the substrate temperature too high or too low. "Generally, when the temperature of the substrate is high, aggregation is apt to occur in the inside of the thin film. As a result, each of islands is shaped like a sphere, so that it is difficult to form a continuous structure even in the case where the thickness of the thin film is relatively large." (page 5, lines 13-18). This can cause abnormal light absorption called surface plasma resonance absorption, and in the case of a silver transparent conductive thin film, the electromagnetic wave shielding function cannot be fulfilled sufficiently because electric resistance in the direction of width of the film is remarkably reduced as well as visible light transmittance in a certain wave range. (page 5, line 23 - page 6, line 8). When the deposition rate is high, the thin film may easily be formed as a continuous structure. However, when this deposition rate is heightened, dependence on transmittance of wavelengths is so large that the transparent laminate cannot exhibit the color tone of neutral gray thought visible light transmittance is improved overall. (page 5, line 18 - page 6, line 13).

The specification explains that the inventors discovered that when the temperature of the substrate and the deposition rate of the silver transparent are controlled, delicate light absorption different from the aforementioned general surface plasma resonance absorption occurs. As a result, wavelength dependence of visible light transmittance is reduced so that the transparent laminate can exhibit the color tone of neutral gray without addition of any

absorbent such as a dye into the transparent substrate. (page 6, line 14 - page 7, line 4). Moreover, the specification explains that transparent laminate produced as recited in claims 13 and 14 has transmittance kept sufficiently high with respect to the whole visible light range and can satisfy all properties such as electromagnetic wave shielding property, near-infrared cutting property, visible light low-reflecting property, etc. required of a PDP film in spite of the simple structure of the claimed transparent laminate. (page 7, lines 5-11). The specification also explains that the inventors found that a light-weight thin PDP filter of good visibility having the aforementioned properties can be obtained using the claimed transparent laminate. (page 7, lines 11-14).

The specification also explains that with the use of the claimed invention is significant in achieving a more delicate light absorption as compared with the light absorption of a conventional silver transparent conductive thin film. (page 17, lines 18-23). The specification explains the problems associated with having a temperature which is too high or too low (page 17, line 23 - page 18, line 24). Additionally, the specification sets forth specific results of sample produced at temperatures below (333k for sample 5 and 303 k for sample 6) and above (413 k for both samples 7 and 8) the claimed ranges showing the unsuitability of the samples which were produced outside of the claimed ranges and, thus, the criticality of these ranges. (page 25, line 12 - page 33, line 7). Applicants respectfully submit that the specification sets forth adequate evidence of the criticality of the claimed ranges and that this criticality is not taught or suggested in the applied reference. Applicants respectfully request withdrawal of these rejections.

III. FORMAL MATTERS AND CONCLUSION

The Office Action points out that Applicant's have yet to file a certified copy of priority documents. Applicants submit along with this Response a Submission of Certified Copy of Priority Documents.

The Office Action objects to the drawings. In particular, the Office Action requests correction of Fig. 3. Applicants submit along with this Response a Request for Approval of Drawing Corrections which includes a correction to Fig. 3 in accordance with Examiner Markham's suggestion.

The Office Action objects to the specification. This Amendment amends the specification in accordance with Examiner Markham's suggestions. With respect to surface resistance, the units of measure set forth in the specification are well known and correct. The unit "Ω/□" is a corrected resistance value obtained by multiplying a resistance value of the sample itself by a correction coefficient listed in JIS (Japan Industrial Standards). Here, the correction coefficient is determined by the shape (planar area) and the thickness of the sample. In the United States, it is common to use the expression "Ω/sq". This correction coefficient is common between the United States and Japan since it is determined by the shape and the thickness of the sample as set forth above.

The Office Action rejects claims 13-14 under 35 U.S.C. section 112, second paragraph. Specifically, the Office Action asserts that the terms "high-refractive index" and "thin films" are relative terms which render the claims indefinite. Applicants respectfully traverse this rejection.

The fact that claim language, including terms of degree, may not be precise, does not automatically render the claim indefinite under 35 U.S.C. 112, second paragraph. Acceptability of the claim language depends on whether one of ordinary skill in the art would understand what is claimed, in light of the specification (see M.P.E.P. 2173.05(b)). Applicants respectfully submit that one of ordinary skill in the art would understand what is claimed, in light of the specification.

The specification of the present application sets forth an example of a high refractive index optical film as having a refractive index in a range of from 1.9 to 2.5 (page 20, lines 5-9). The specification also provides several examples of the material for such a high refractive index film and a method of making that film (see, for example: page 5, lines 9-21; page 25, line 22 through page 26, line 3). The specification also sets forth numerous examples of what one of ordinary skill in the art would understand to be a "thin film" (see, for example: page 5, lines 5-8; page 8, line 1 through page 9, line 3). Lastly, the specification explains what the composition of the silver transparent conductive thin film may be constituted at, for example, page 20 line 22 - page 21, line 10. Applicants respectfully submit that one of ordinary skill in the art would understand what is claimed, in light of the specification and hereby requests withdrawal of this rejection.

In view of the foregoing amendments and remarks, Applicants respectfully submit that the Application is in condition for allowance. Applicants respectfully request prompt reconsideration and allowance.

Should the Examiner believe that anything further is desirable to place the application into condition for allowance, Applicants invite the Examiner to contact the undersigned attorney at the telephone number listed below.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: 4/25/02

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the specification:

Please delete page 10, lines 1-21 and replace with the following paragraph:

--In the above transparent laminate, preferably, the laminate further comprises a low-refractive-index transparent thin film deposited on the surface of the transparent substrate, the low-refractive-index transparent thin film having a refractive index n_L in a range of from 1.3 to 1.6 and having a thickness of 550 nm X (¼ n_L) X (1 ± 0.15). In the above transparent laminate according, preferably, the laminate further comprises a low-refractive-index transparent thin film located as the outermost layer, the low-refractive-index transparent thin film having a refractive index n_L in a range of from 1.3 to 1.6 and having a thickness of 550nm X (½ n_L) X (1 ± 0.15). Further, in place of such a low-refractive-index transparent thin film, the above transparent laminate further comprises any one of an anti-reflection film, an anti-mirroring film and a low-reflection anti-mirroring film stuck onto the surface of the high-refractive-index transparent thin film located as the outermost layer, through a transparent adhesive layer. Accordingly, the transparent laminate configured as described above can be provided as a [surfacemar-proof] surface marproof transparent laminate without spoiling optical performance.- -

Please replace page 31, table 1, with the following table:

		Example	
Sample Number		(1)	(2)
Surface Resistance [(Ω/□)] (Ω/sq)		1.6	1.6
Visible Light Transmittance (%)	Wavelength: 450nm	54.8	55.9
	Wavelength: 500nm	56.5	57.7
	Wavelength: 550nm	57.7	58.8
	Wavelength: 600nm	56.7	57.7
	Wavelength: 650nm	52.6	53.1
	Standard Deviation	2.0	2.2
Average Luminosity Transmittance (%)		57.0	58.1
Near-Infrared Cutting Rate (%) <wavelength: 850 nm>		95.6	95.2
Average Luminosity Reflectivity (%)		2.7	2.8
Color Tone of Transmitted Light		ND	ND

Please replace page 31, table 2, with the following table:

		Example	
Sample Number		(3)	(4)
Surface Resistance [(Ω/□)] (Ω/sq)		1.8	1.9
Visible Light Transmittance (%)	Wavelength: 450nm	53.9	54.0
	Wavelength: 500nm	55.9	58.9
	Wavelength: 550nm	58.2	61.5
	Wavelength: 600nm	58.0	59.3
	Wavelength: 650nm	52.4	55.1
	Standard Deviation	2.5	3.1
Average Luminosity Transmittance (%)		56.4	60.1
Near-Infrared Cutting Rate (%) <wavelength: 850 nm>		95.3	94.4
Average Luminosity Reflectivity (%)		0.9	0.8
Color Tone of Transmitted Light		ND	ND

Please replace page 32, table 3, with the following table:

		Comparative Example			
Sample Number		(5)	(6)	(7)	(8)
Surface Resistance [(Ω/□)] (Ω/sq)		1.8	1.8	5.9	6.6
Visible Light Transmittance (%)	Wavelength: 450nm	63.8	63.1	37.5	45.3
	Wavelength: 500nm	69.8	68.9	32.6	34.1
	Wavelength: 550nm	66.7	69.1	25.9	30.2
	Wavelength: 600nm	61.8	61.2	18.8	25.4
	Wavelength: 650nm	52.9	53.8	13.6	16.0
	Standard Deviation	6.4	6.3	9.8	10.8
Average Luminosity Transmittance (%)		65.3	67.7	24.9	29.7
Near-Infrared Cutting Rate (%) <wavelength: 850nm>		95.4	95.1	98.2	98.1
Average Luminosity Reflectivity (%)		2.7	2.6	2.4	0.8
Color Tone of Transmitted Light		G	G	DB	DB

Please replace page 36, table 4, with the following table:

		Example			[Compara-ti ve Example] Comparative Example	
Sample Number		(9)	(10)	(11)	(12)	(13)
[Mar-Proofness] Marproofness		X	O	O	O	O
Visible Light [Trans-mi ttance] Transmittance (%)	Wavelength: 450nm	55.9	52.5	50.9	51.4	48.8
	Wavelength: 500nm	57.5	55.9	54.2	54.2	51.5
	Wavelength: 550nm	58.8	56.3	54.7	53.9	50.7
	Wavelength: 600nm	57.9	55.0	53.4	53.4	51.2
	Wavelength: 650nm	53.5	51.4	49.9	50.4	48.4
	Standard Deviation	2.1	2.2	2.1	1.7	1.4
Average Luminosity Transmittance (%)		58.1	55.9	53.2	52.8	49.7
Near-Infrared Cutting Rate (%) <wavelength: 850 nm>		95.5	96.3	97.1	96.8	96.9
Average Luminosity Reflectivity (%)		0.9	2.7	2.9	4.8	7.1
Color Tone of Transmitted Light		ND	ND	ND	ND	ND

In the claims:

Please cancel non-elected claims 1-12 without prejudice or disclaimer.

Please amend claims 13 and 14 and add new claims 15-22 as follows:

13. (Amended) A method for producing a transparent laminate comprising [steps of]:

preparing a transparent substrate;

depositing a high-refractive-index transparent thin film by a vacuum dry process;

depositing a silver transparent conductive thin film by a vacuum dry process;

repeating [said steps for] the depositing of the high-refractive-index transparent thin film and the silver transparent conductive thin film at least three [or four] times to thereby form at least three [or four] combination thin-film layers of the high-refractive-index transparent thin film and the silver transparent conductive thin film successively laminated on a surface of said transparent substrate; and

depositing another high-refractive-index transparent thin film on a surface of said combination thin-film layer by the vacuum dry process,

wherein, when said silver transparent conductive thin films are deposited by the vacuum dry process, temperature T (K) of said transparent substrate at the time of the deposition of said films is set to be in a range $340 \leq T \leq 410$.

14. (Amended) A method for producing a transparent laminate comprising [steps of]:

preparing a transparent substrate;

depositing a high-refractive-index transparent thin film by a vacuum dry process;

depositing a silver transparent conductive thin film by a vacuum dry process;

repeating [said steps for] forming of the high-refractive-index transparent thin film and the silver transparent conductive thin film at least three [or four] times to thereby form at least three [or four] combination thin-film layers of the high-refractive-index transparent thin film and the silver transparent conductive thin film successively laminated on a surface of said transparent substrate; and

depositing another high-refractive-index transparent thin film on a surface of said combination thin-film layer by the vacuum dry process,

wherein, when said silver transparent conductive thin films are deposited by the vacuum dry process, temperature T (K) of said transparent substrate at the time of the deposition of said films is set to be in a range $340 \leq T \leq 390$, and deposition rate R (nm/sec) of said silver transparent conductive thin films is set to be $R = (1/40)x(T-300) \pm 0.5$.

--15. (Newly Added) The method of claim 13, further comprising depositing a low-refractive-index transparent thin film.--

16. (Newly Added) The method of claim 15, wherein the low-refractive-index transparent thin film is deposited before the high-refractive-index thin film depositing.

17. (Newly Added) The method of claim 15, wherein the low-refractive-index transparent thin film is deposited after the high-refractive-index thin film depositing.

18. (Newly Added) The method claim 13, further comprising forming a plasma display panel filter with the transparent laminate.

19. (Newly Added) The method of claim 14, further comprising depositing a low-refractive-index transparent thin film.

20. (Newly Added) The method of claim 19, wherein the low-refractive-index transparent thin film is deposited before the high-refractive-index thin film depositing.

21. (Newly Added) The method of claim 19, wherein the low-refractive-index transparent thin film is deposited after the high-refractive-index thin film depositing.

22. (Newly Added) The method claim 14, further comprising forming a plasma display panel filter with the transparent laminate.- -

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Nakamura et al.

Serial No.: 09/746,228 **Group Art Unit:** 1762

Filed: December 26, 2000 **Examiner:** Markham, W.

For: TRANSPARENT LAMINATE, METHOD FOR PRODUCING THE SAME, AND PLASMA DISPLAY PANEL

Assistant Commissioner of Patents
Washington, D.C. 20231

REQUEST FOR APPROVAL OF DRAWING CORRECTIONS

Sir:

Submitted herewith are proposed drawing corrections, marked in red, to Figure 3. Please substitute the attached drawing Figure for the original drawing Figure which was filed with the application.

Approval and acknowledgment of receipt are respectfully requested.

Respectfully submitted,

Date: 4/29/02

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